was a brilliant success, and the experiences noted in this paper are of great value; but the result to the patient may be guessed at by his exclamation some months after the operation: "C'était mieux quand je ne voyais pas."—On the action produced on the sensibility and motility of nerves by dilute hydrochloric acid, by Dr. C. Negro.—Note on pneumonococcus, a grave complication in pneumonia, by P. Foa and G. Rattone.—On the physio-pathological aspects of stratified pavement epithelium, and on the pathogeny of albuminuria, by Prof. G. Tizzoni.—On the presence of albumen in saliva, a criticism of the views of Madame Dessales by Prof. Brancaccio, and a reply by Madame Dessales.—On the central termination of the optic nerve in some mammals, by Dr. J. Bellonci.—On the influence of chloral on gastric digestion, by A. Fiumi and A. Favrat.—Anatomical and clinical study of Morgagni's cataract; and on congenital micro-ophthalmy, by Dr. Falchi.

Rivista Scientifico-Industriale, December 15-31.—Dr. Pietro Cardani, variation of the diameter of the sparks with the potential and the resistance: a study of the way the diameter of the sparks is modified by the resistance of the circuit, and how the diameter itself varies with the increase of the explosive distance. The diameter is found to increase proportionately to the square root of the potential, and to decrease according to a hyperbolical function with the increased resistance; hence for great distances this diameter becomes sensibly constant. The same physicist deals with Harris's second law that the explosive distance varies inversely with the pressure of the gas, and concludes that this law is true only within certain limited conditions.—Dante Roster, remarks in connection with Prof. Mariacher's observations on the food of birds. These studies have a practical value, tending to determine those birds which are insectivorous, and consequently harmless, and those that are graminivorous and injurious to the crops.

Reale Istituto Lombardo, January 7.—Summary of Tito Vignoli's monograph on "The Psychic Act of Attention in the Animal Series," in which the author describes the genesis of attention from the lowest to the highest organisms, analysing the elements of sensation and perception, and determining their comparative values. The physiological and psychological conditions of attention are held to be identical in the higher animals and in man, differing only objectively, and man alone being capable of introspective thought. Hence man is distinguished from other animals, not by the physio-psychic act of attention, but by the faculty of submitting his own intelligence to examination.—In a supplementary note on the transition from animal to human intelligence, Vignoli argues that Darwinism will never succeed in explaining the evolution of the organic from the inorganic, nor of sensation and consciousness from the mere organic. The passage from the intelligence of animals to that of man is not a gradual development of the faculties, but is accomplished by a reflex act of animal intelligence on itself. This act must be instantaneous, consequently is not the result of evolution, as are the physical conditions leading up to it.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, January 7.—"Experimental Researches on the Propagation of Heat by Conduction in Muscle, Liver, Kidney, Bone, and Brain." By J. S. Lombard, M.D., formerly Assistant Professor of Physiology in Harvard University. Communicated by Charles E. Brown-Séquard, M.D., LL.D., F.R.S.

January 14.—"Notes upon the Straining of Ships caused by Rolling." By Prof. Francis Elgar, LL.D., F.R.S.E

It does not appear that any serious attempt has yet been made to investigate the amounts, or even the nature, of the principal straining actions which the rolling of a ship brings into play, or of the effect of those straining actions upon the material of which the hull is composed. Various writers, from Bouguer in 1746, down to Prof. Macquorne Rankine in 1866, and Sir E. J. Reed in 1871, have discussed the straining actions that are caused by longitudinal racking and bending when a vessel is floating in statical equilibrium. Sir E. J. Reed elaborately investigated the subject in a paper contained in the *Philosophical Transactions* of the Royal Society for 1871, and gave examples of the amounts and distribution of the stresses caused by such straining actions in several typical ships of Her Majesty's Navy. Mr. W. John supplemented this by a paper on the strength of iron ships, read before the Institution of Naval Architects in 1874, in which similar results were given for various classes of vessels in the mercantile marine.

The later investigations of these longitudinal straining actions apply not only to the case of a ship floating in equilibrium in still water, but also to cases in which she is (1) in instantaneous statical equilibrium across the crest of a wave; and (2) in instantaneous statical equilibrium across the hollow of a wave—the wave-length being equal to the length of the ship.

Cases frequently occur which show that the maximum stresses of the material of a ship's hull are not in proportion to the results obtained by the ordinary calculations; and that certain deductions that have been drawn from those results are by no means sound. For instance, it is said to follow from the analogy between the longitudinal bending action upon a ship afloat and that upon a loaded girder, that there is little or no stress exerted upon that portion of a ship's plating which is in the vicinity of the neutral axis for the upright position; and the inference has been drawn that, subject to the consideration of the sides being occasionally brought, in some degree, into the positions of flanges of a girder at large inclinations, the thickness of the material may be decreased with advantage near the neutral axis. Now it cannot be shown that the plating which is in the vicinity of the neutral axis when the ship is upright, is ever brought into such a position by the rolling of a vessel as to be much affected by mere longitudinal bending.

Other propositions respecting the distribution of stress in various parts of the structure have been deduced from considerations and assumptions upon which the ordinary calculations of longitudinal strength are based; and rules have, in consequence, been proposed for regulating the strength of the principal component parts of ships' hulls. It is only necessary here to say that many of those deductions, like the one already noticed, are unsound, and are not consistent with the effects that may be observed of straining action at sea.

A considerable experience at sea, where the author has closely observed the effects of straining action caused by twisting moments, and a further experience in investigating the stresses to which the various portions of ships' hulls are subjected according to the theories referred to, and in comparing the results so obtained with the visible evidences of straining action, have convinced him that the stresses caused by twisting moments are much greater than is generally supposed, and that no rules for regulating the strength of ships can be satisfactory if based upon hypotheses that exclude all practical consideration of twisting moments.

The straining action considered in this paper is that caused by the twisting moments which operate when a ship rolls from side to side, and which are caused by differences in the longitudinal distribution of the moments of the forces that cause rotation, and those which resist rotation.

After describing at length the manner in which the twisting moments may be approximately calculated, the author proceeds to consider the amounts and distribution of the stresses upon the material of the hull which are caused by a given twisting moment:—

We can learn something of the nature and distribution of those stresses; but, at present, their amounts cannot be calculated with any reliable approach to accuracy. Experiments are required upon the torsion of thin shells of various prismatic forms in order to furnish the requisite data for dealing with so complicated a case as that of a ship's hull. The difficulty of obtaining exact data is very great; but attention is drawn to some of the general considerations which affect the twisting moments and the distribution of the twisting strains and stresses over a ship's hull; and to the bearing which these have upon the important practical problems that relate to the structural strength of ships.

The best data available for guidance in judging of the distribution of strain and stress due to twisting over the structure of a ship are to be found in M. de Saint-Venant's investigations of the torsion of prisms.[1]

The distribution of the torsional stresses over the transverse section of a ship's hull is obviously different from the distribution of the stresses due to longitudinal bending. The parts subjected to greatest stress by twisting are those which are near to the centre of gravity of the transverse section; and they are the side plating near the neutral axis of longitudinal bending in the upright position and the middle portions of the plating of the decks. Those parts of the hull which are usually made the strongest, viz., the strakes of side and bottom plating that are farthest from the neutral axis, and the upper deck stringer plate, are those which are least affected by twisting. It is probably owing, in great measure, to the straining action caused by twisting, that experience has proved it to be necessary to make the outside plating of a ship of nearly uniform thickness over the whole section; and it cannot be because of the reason sometimes given, that the plating in the vicinity of the neutral axis when a ship is upright is often brought by rolling into positions in which it is greatly strained by longitudinal bending.

---

[1] "Mémoires présentés par divers Savants à l'Académie des Sciences de l'Institut Impérial de France," tome 14, 1856. "Mémoire sur la Torsion de Prismes, &c." Par M. de Saint-Venant," pp. 233-560. Also Thomson and Tait's "Natural Philosophy," vol. i., part 2, secs. 699-710.

The importance of many of the structural arrangements of ships which practical experience has shown to be necessary are described in the present paper, and may be understood from the considerations adduced; and it may also be seen that no rules for regulating the strength of ships are likely to be satisfactory if based, as is often done, upon the hypothesis that the straining actions caused by longitudinal bending are so much more important than all others that it is sufficient to regard them alone.

Abstract of Paper on "Proteid Substances in Latex." By J. R. Green, B.Sc., B.A., Demonstrator of Physiology in the University of Cambridge.

The author, after calling attention to the researches of other writers into the nature of the proteids found especially in seeds, described certain bodies found by him to be present in the latex of various plants, chiefly East Indian and South American. The most noteworthy of these was a curious proteid exhibiting relations to the peptones and to the albumoses, resembling the former in being soluble in distilled water, in not being coagulated by heat, and in dialysing through membranes, and agreeing with the latter in being precipitated from its solutions in saturation with solid neutral salts. In addition to this body, which was present in all the samples examined, others were described, including a form of albumen, a globulin, and two albumoses, one of the latter being identical with the hemi-albumose described by Vines as occurring in many seeds. The paper concluded with a recapitulation of the bodies found, and with a detailed summary of their distinguishing reactions.

February 4.—"On Intra-vascular Clotting." By L. C. Wooldridge, M.B., D.Sc. Communicated by Prof. Sanderson.

The author has isolated from the perfectly fresh thymus gland and testis of the calf a substance which, when dissolved in alkaline salt solution and injected into the blood of an animal, causes instantaneous death.

The substance in question is a complex proteid body, and as proof that the effects it produces are due to this proteid and not to any accidental admixture, the author adduces the fact that it becomes entirely inactive after having been subjected for a short time to the action of artificial peptic digestion.

The cause of death is extensive intra-vascular clotting of the blood; if a sufficient quantity be injected, complete thrombosis of the whole vascular system is produced. The substance does not contain any fibrin ferment, nor does the blood which is obtained from an animal after injection of this substance contain more than a minute trace of ferment.

Mathematical Society, February 11.—Mr. J. W. L. Glaisher, F.R.S., President, in the chair.—Prof. P. H. Schoute, Ph.D., Groningen, Netherlands, was elected a Member.—Capt. P. A. Macmahon, R.A., read a paper on perpetuant reciprocants, the object of which was to present the numerical enumeration of the perpetuant reciprocants of the first six degrees carried out on the plan initiated by Prof. Sylvester (see NATURE, January 7, p. 222, *Comptes rendus*, and the *Messenger of Mathematics*).—The President communicated a note on the functions $Z(u)$, $\theta(u)$, $\pi(u,a)$ by himself, and a note on a $Z(u)$ function by Mr. J. Griffiths.—The Secretary read part of a paper by Mr. R. A. Roberts on polygons circumscribed about a conic and inscribed in a cubic.

Anthropological Institute, January 26.—Anniversary Meeting.—Mr. Francis Galton, F.R.S., President, in the chair.—The following gentlemen were elected Members of the Council for the ensuing year:—President, Francis Galton, F.R.S.; Vice-Presidents: John Beddoe, F.R.S., Capt. R. F. Burton, Prof. G. Busk, F.R.S., John Evans, F.R.S., Prof. Flower, F.R.S., Prof. Huxley, F.R.S., Sir John Lubbock, Bart., F.R.S., Major-General Pitt-Rivers, F.R.S., Edward B. Tylor, F.R.S., Hyde Clarke, Lieut.-Col. H. H. Godwin-Austen, F.R.S., Prof. A. H. Keane; Secretary, F. W. Rudler, F.G.S.; Treasurer, F. G. H. Price, F.S.A.; Council: S. E. B. Bouverie-Pusey, Sir W. Bowman, Bart., E. W. Brabrook, F.S.A., Sir George Campbell, C. H. E. Carmichael, M.A., W. L. Distant, A. W. Franks, F.R.S., J. G. Garson, M.D., A. L. Lewis, Prof. A. Macalister, F.R.S., R. Biddulph Martin, Prof. Meldola, Prof. Moseley, F.R.S., C. Peek, M.A., J. E. Price, F.S.A., Charles H Read, F.S.A., Charles Roberts, F.R.C.S., Lord Arthur Russell, Prof. G. D. Thane, M. J. Walhouse, F.R.A.S.

Entomological Society, February 3.—Mr. R. McLachlan, F.R.S., President, in the chair.—The President appointed Mr. F. Du Cane Godman, F.R.S., Mr. Stainton, F.R.S., and Mr. J. Jenner Weir, Vice-Presidents for the year.—Dr. Livett, Lieut. Goodrich, Mr. Eustace Bankes, and Mr. F. Enock were elected Fellows, and M. Ragonot of Paris, ex-President of the Entomological Society of France, was elected a Foreign Member.—Mr. C. O. Waterhouse exhibited some cocoons of *Coccidæ* (*Eriopeltis*) found by Mr. Moore on blades of grass at Ilfracombe.—Mr. Douglas sent for exhibition leaves of *Euonymus japonicus*, received from M. Lichtenstein, infested by a coccid, *Chionaspis euonymi*, first noticed in the United States, but which occurred in great numbers at Montpellier and Nismes, and always destroyed the shrubs attacked by it.—The President exhibited specimens of *Tettix australis*, received from Mr. Oliff of the Sydney Museum, who had captured them near Penrith, New South Wales. Mr. Oliff stated that the insects were decidedly sub-aquatic, as he had found them 8 or 10 inches below the surface of the water on the stems of water plants.—Mr. W. F. Kirby exhibited, on behalf of Mr. Ralfe, a series of specimens of *Lycæna corydon* of a very extraordinary character.—The Rev. W. W. Fowler exhibited a specimen of the almost unique beetle, *Harpalus calceatus*, taken by himself at Bridlington; also a specimen of *Apion Lemoroi*, a new French *Apion* taken on the coasts of Normandy and Brittany. He also exhibited several species of British *Helophori*, and read notes on their synonymy.—Mr. H. Goss read an analysis of M. Brongniart's recent work on "Les Insectes fossiles des Terrains Primaires," and expounded that author's views on the classification of insects from geological data.—The Rev. W. W. Fowler read notes on a small collection of *Languriidæ*, with descriptions of two new species.—Dr. Baly communicated a paper containing descriptions of new genera and species of *Galerucidæ*.—Mr. J. Edwards communicated the first part of a synopsis of British *Homoptera* (*Cicadina*).

Institution of Civil Engineers, January 26.—Sir Frederick J. Bramwell, F.R.S., President, in the chair.—The paper read was on the injurious effect of a blue heat on steel and iron, by Mr. C. E. Stromeyer, Assoc.M.Inst.C.E.

MANCHESTER

Literary and Philosophical Society, December 1, 1885.—Prof. W. C. Williamson, LL.D., F.R.S., President, in the chair.—The diffraction of a plane polarised wave of light, by R. F. Gwyther, M.A.—On the different arrangements of equal spherical granules, so that the mean density may be a maximum, by Prof. Osborne Reynolds, F.R.S.

DUBLIN

Royal Society, January 20.—Section of Physical and Experimental Science.—C. R. C. Tichborne, Ph.D., in the chair.—On a nomenclature for facilitating the study of music, by G. J. Stoney, D.Sc., F.R.S.—Notes on improvements in equatorial mountings, by Howard Grubb, M.E., F.R.S. These consisted of a new slow motion in declination, a new position finder, and a modification of the old differential slow motion in right ascension. Mr. Grubb also described a new slow motion in right ascension, and a new arrangement for electric clock control specially adapted for celestial photography.—Dr. Stoney communicated notes on observations made by Prof. Vogel with the great Vienna refractor.—On a method of determining the specific gravity of a small quantity of a dense solid, also applicable to finding the specific gravity of a small quantity of a porous substance, by J. Joly, B.E. The ordinary method of dealing with minute fragments of minerals, by balancing in a liquid of a specific gravity adjustable to that of the mineral, fails altogether (*a*) when the substance has a specific gravity over 4·5 about; (*b*) when it is of a porous nature. The author deals with minerals having a specific gravity above that of Thulet's solution, or of a porous nature, by embedding a known weight of the mineral in a known weight of paraffin of known specific gravity, and then determining the specific gravity of the mixed bodies by balancing in a solution of low density. From these data the required specific gravity is calculable. Several experiments carried out on fragments of heavy or dendritic minerals ranging in quantity from 12 to 35 milligrames were quoted. These gave results concordant with recorded densities, and, where carried out on pieces removed from the same hand specimen, were uniformly consistent.—Celestial phenomena explicable by meteors, by W. H. S. Monck, M.A.

Section of Natural Science.—J. P. O'Reilly, C.E., in the chair.—Notes on the energy of the Ischia earthquakes of 1881 and 1883, by Rev. Dr. Haughton, F.R.S.—Dr. Haughton also communicated an extract from a letter from a lady in India, respecting the fall of a meteoric stone at Roorkee.—Note on *Edwardsia timida* (Quatr.), by G. T. Dixon, M.A. The specimen was found at Malahide, Co. Dublin. This is the first record of the occurrence of this species in the British Isles.

SYDNEY

Linnean Society of New South Wales, November 25, 1885.—W. J. Stephens, F.G.S., President, in the chair.—The following papers were read:—A list of the Trogositidæ of Australia, with notes and descriptions of new species, by A. Sidney Olliff, F.E.S., Assistant Zoologist, Australian Museum.—Notes from the Australian Museum—a new butterfly of the family Lycænidæ, from the Blue Mountains, by A. Sidney Olliff, F.E.S., Assistant Zoologist, Australian Museum.—On a remarkable fish, from Lord Howe Island, by William Macleay, F.L.S., &c. Under the name of *Ctenodax wilkinsoni*, Mr. Macleay described a fish picked up on the beach at Lord Howe Island, and made some remarks on its probable affinities. He considers it not referable to any known family.—Recent changes in the forest flora of the interior of New South Wales, by R. von Lendenfeld, Ph.D. Based on observations made by Mr. Forest Ranger Ridston and others, and on his own experience in the Nymagee-Condobolin district, the author gives an account of the rapid spreading of the pine (*Frenela robusta*) within the last twenty years. A table giving averages of the rainfall, the spread of the pine and of the beetle *Diodoxus erythrurus*, White, which in its larval stage destroys the young pine-trees, accompanies the paper.—The Australian freshwater Rhizopods, Part I., by R. von Lendenfeld, Ph.D. This paper is the first of an intended series in which the Australian Protozoa belonging to the groups Rhizopoda and Heliozoa are to be registered, and the new species described. In this paper six species are mentioned, two are new. It is a most remarkable fact that the common and well-known European forms are all apparently found in equal abundance in Australian waters. The new species are very similar to European ones, and do not present any marked peculiarities. It does not appear likely that there were no Rhizopods in Australian creeks before the advent of Europeans, and so it cannot be assumed that all these Australian species have been imported. As they cannot travel over the oceans dividing Australia from other continents, it must be assumed that they are unchanged descendants of the Rhizopods of that geological period, in which Australia was not isolated. The absence of forms peculiar to Australia speaks strongly against any recent spontaneous generation.—An Alga forming a pseudomorph of a siliceous sponge, by R. von Lendenfeld, Ph.D.—*Onchidium chameleon*, sp. nov., and the structure of the dorsal skin of this and other Onchidia, by R. von Lendenfeld, Ph.D., and John Brazier, C.M.Z.S.—Observations on some Australian Polychæta, by W. A. Haswell, M.A., B.Sc., &c.—Descriptions of two new fishes from Port Jackson, by E. P. Ramsay, F.R.S.E., &c., and J. Douglas-Ogilby, Australian Museum.—On some remarkable crystals of siderite, by F. Ratte, Eng., Arts and Manufactures (Paris).

PARIS

Academy of Sciences, February 8.—M. Jurien de la Gravière, President, in the chair.—Discourses on the occasion of unveiling the statue erected in front of the Collège de France to the memory of Claude Bernard, on February 4, by MM. Paul Bert, Berthelot, Fremy, and Chauveau. The statue, which is cast in bronze, is the work of M. Guillaume, Member of the Institute.—Farewell address of M. Paul Bert on his departure to Tonquin, where he has recently been appointed Civil Administrator. In the course of his remarks the speaker expressed a hope that the young naturalists of the West would begin to turn their attention to the Far East, and teach the learned classes of those regions more fully to appreciate the superiority of European science. "I rely on them," he added, "to increase our moral influence, and also to enlarge our knowledge of that region, in many places still unexplored, to study its resources, and prepare the way for the introduction of the great European industries. They will thus at once promote the interests of science and of France, a task enviable beyond all others."—Remarks on the celebration of the centenary of Arago's birth, on February 26th prox., by M. Mouchez. It was stated by the speaker that the celebration would take the form of a public ceremony in the presence of the various deputations, during which would be crowned the bust of Arago, occupying the site on the Boulevard Arago, where a monumental statue is subsequently to be raised to the great astronomer by public subscription. The proceedings will close with a subscription banquet at the Hôtel de Ville, to which will be invited the members of the Arago family.—Note on celestial photography, by M. Mouchez. Amongst the stellar photographs already obtained at the Paris Observatory, was one of the nebula near the star Maia in the Pleiades, which had never before been seen with the best glasses. But M. Struve now telegraphs to the author that he has just detected this nebula with the new large equatorial of 0·80 m., recently set up in the Pulkova Observatory. It was added that Dom Pedro, Emperor of Brazil, had instructed M. Cruls, Director of the Rio de Janeiro Observatory, to prepare a photographic apparatus similar to that now in use in Paris, for the purpose of co-operating in the general project of photographing the starry regions, already begun with such unexpected success at the Paris Observatory.—Determination of the elements of refraction, two diagrams, by M. Lœwy. It is shown that, in spite of all the rotatory movements of the double mirror, the fundamental condition for determining the constant of refraction is always fulfilled. This principle rests on the geometrical property that the projection of the distance of two images on the trace of the plane of reflection remains invariable and always equal to the distance $r'p'$ relative to the epoch when the two stars and their two reflected images are found comprised in the same plane.—On some hyper-elliptical formulas, by M. Brioschi.—Note on the first botanical collections that have reached the Paris Natural History Museum from Tonquin, by M. Ed. Bureau. This first collection, carefully prepared by M. Balansa, is confined exclusively to the neighbourhood of Hai-Phong and of Quang-Yen; but it gives a complete picture of the flora of these districts.—Remarks on the admission of patients suffering from pulmonary tuberculosis into the public hospitals, with a view of determining how far this disease is contagious, by M. E. Leudet. The elements that have served to offer a solution of this question are the records of 16,094 adult patients of both sexes treated in one of the wards of the Rouen Hôtel-Dieu during the thirty-one years from 1854 to 1885. The author concludes that the propagation of pulmonary tuberculosis by contagion in hospitals has not been demonstrated, or that it is at least very restricted.—Observations on Fabry's comet made at the equatorials of the Bordeaux Observatory, by MM. G. Rayet and Courty.—Equatorial observations on Barnard's comet, made at the Bordeaux Observatory, by M. F. Courty.—Observation of Brooks's comet made with the 14-inch equatorial of the Bordeaux Observatory, by MM. G. Rayet and Courty.—On the shower of shooting-stars observed on November 27, 1885, at the Zi-ka-wei Observatory near Shanghai, China, by Père Marc Dechevrens. The meteoric display is described as less imposing than that of November 27, 1872. The stars appear to have swept by at the rate of about a hundred every 15 minutes. Notwithstanding the moonlight a few were still seen so late as 4 a.m. the following morning.—On a new system of projection of the sphere suggested by an inquiry into the means of representing the elliptical functions geometrically, by M. Guyon.—Note on Ivory's theorem and on some theorems in connection with the homofocal surfaces of the second order, by M. A. Mannheim.—Researches on the groups of finite order contained in the group of the linear substitutions of contact, by M. Autonne.—Note on a new process for preparing orthophosphoric acid, and the titration of phosphoric and arsenic acids by means of various indicators, by M. A. Joly.—Note on the action of acetic acid on the essence of turpentine, by MM. G. Bouchardat and J. Lafont. It is shown that acetic acid combines already in the cool state with the essence of turpentine, yielding monacetates belonging to two entirely distinct series. At the same time the uncombined essence is transformed into two carburets $C_{20}H_{16}$, one monovalent, analogous to terebinthene, the other bivalent, or active terpilene.—Note on a new direct method of studying animal heat, by M. Desplats. The method here described is carried out by means of M. Berthelot's water calorimeter, but it is applicable only to small animals, such as rats, guinea-pigs, sparrows, &c. At equal weight and in a given time birds are found to evolve three times more heat than mammals, absorbing thrice the quantity of oxygen and emitting three times more carbonic acid.—Note on the Eocene Echinidæ belonging to the family of the Spantangideæ, by M. G. Cotteau.—On some fossil Cycadeæ of the Carboniferous formations, by M. Daubrée.—On a sub-lacustrine moraine on the bar of Yvoise, which divides Lake Geneva into two distinct basins, by M. F. A. Forel. The dredgings carried out in September 1885 have satisfied the author that this bar is, in fact, a glacial moraine like the neighbouring hills. That this moraine, 60 metres below the surface and 1 kilometre from the shore, has been kept clear of recent lacustrine alluvial deposits, is attributed to the action of the sub-lacustrine currents.—Remarks on the geological map of Russian Turkestan prepared by MM. Mushketoff and Romanovsky—six chromolithographic sheets to the scale of 1 : 1,260,000, by M. Venukoff.—Note on the relations existing between the geological, topographic, and chemical properties of the soil and the vegetation covering it in Central Russia, by M. Venukoff.

BERLIN

Meteorological Society, December 1, 1885.—Prof. Börnstein reported on a treatise by Herr van Bebber, which had just appeared, in which the latter, on the ground that typical weather phenomena accompanied the minima that advanced along the well-known highways of storms over Europe, demonstrated that, from the position of the minimum on one of the five highways of storms, and from the local condition of the weather, might be derived the best data as a basis for a trustworthy prognostication of the weather.—Prof. Schwalbe made a comprehensive survey of the investigations that had been carried on by him for several years respecting the ice cavities. In supplement of former reports on these investigations (*vide* NATURE, January 28, p. 312) the following is abstracted from the address which dealt at large with the subject. The earliest notice of the occurrence of ice cavities was contained in an account written in the end of the seventeenth century. In the last and in the beginning of the present century ice cavities had been variously described, but the descriptions were greatly exaggerated. Down even to the present time these enigmas of nature were little known and little investigated. Of all students of natural science whom this subject had engaged, the speaker had assuredly examined the greatest number of ice cavities. Ice cavities formed but one group of ice phenomena, which comprehended likewise dolines, ice holes, rolled ice, ventaroles, and the cold strata of the ground. In the temperate zone they were pretty widely distributed, and occurred in the most varied mountain systems of Europe at heights of from 2000 to 4000 metres above sea-level, and some individual ones at much lower elevations. They were found principally in limestone, in gypsum, in basalt, and lava, but were present likewise in mica slate and other stones. The most essential condition of their presence was that the stone should be readily percolable by water. In the majority of cases the entrance into these cavities was from above, and the passage was directed downwards, yet there were also cases in which the entrance was from below and the passage upwards. The cavities themselves were completely isolated, and no draught of wind was ever perceived in them. The air in the cavities was in winter somewhat colder than in summer, in winter the temperature sinking to 0° C., and somewhat lower, in summer ranging from 4° to 5° C. The walls were always colder than the air in the central part, and the air, moreover, was always completely saturated with moisture. The ice is formed in spring, when the water began to filter through the ground, and almost exclusively on the floor of the cavities. The ceiling was always free of ice, the floor more or less uniformly covered with a thick layer of ice, which, on being broken, splits into prismatic pillars resembling honeycombs. The walls were covered with pearl-like ice-crystals, and stalactitic ice formations came multifariously to view. There was frequent opportunity for observing in an ice cavity how the water-drops, having filtered through the stone, fell to the ground, and there at once congealed. The speaker then referred to and combated the various theories which had been brought forward to explain the ice formation in the cavities. His own view was that the water filtering through the cold stone became refrigerated to excess, and therefore, on falling, at once congealed.

BOOKS AND PAMPHLETS RECEIVED

"Report of the Meteorological Council to the Royal Society for the Year ending March 31, 1885."—"Jubilee Volume of the Statistical Society" (Stanford).—"British Petrography," Part I.: J. J. H. Teall (Watson, Bros., and Douglas, Birmingham).—"Register zu den Bänden 86 bis 90 der Sitzungsberichte der Mathematisch-Naturwissenschaftlichen Classe der Kaiserlichen Akademie der Wissenschaften" XI. (Gerold's Sohn, Wien).—"Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften; Mathematisch-Naturwissenschaftliche Classe:—Zoologie, Geologie, und Paläontologie," June and July, October to December, 1884, January to April, 1885. Ditto, "Mathematik, Physik, Chemie, Mechanik, Meteorologie, und Astronomie," June and July, October to December, 1884, January to March, 1885. Ditto, Physiologie, Anatomie, und theoretischen Medicin," March to July, October to December, 1884; January and February, 1885 (Gerold's Sohn, Wien).—"Contributions to Canadian Palæontology,' vol. i. part 1: J. F. Whiteaves (Dawson, Bros., Montreal).—"Report of the Meteorological Service of the Dominion of Canada for the Year ending December 31, 1883": C. Carpmael (MacLean and Co., Ottawa).—"Common-Sense Euclid": A. D. Capel (J. Hughes).—"Poultry for Prizes and Profit," parts 4 and 5: J. Long (L. U. Gill)—"British Cage-Birds," parts 5 and 6: R. L. Wallace (L. U. Gill).—"Bees and Bee-keeping," parts 5 and 6: F. R. Cheshire (L. U. Gill).—"Book of the Goat," parts 5 and 6: H. S. H. Pegler (L. U. Gill).—"Fancy Pigeons," parts 5 and 6: J. C. Lyell (L. U. Gill).—"Why we do not adopt the French Metrical System in place of our Anglo-Saxon Metrology": C. Giles (Banks and Son).

CONTENTS

PAGE
Practical Bacteriology 361
The Anatomy of the Nettle 363

Our Book Shelf:—

Smith's "Magnetism" 364
Flower's "Introduction to the Osteology of the Mammalia" 364
Lydekker's "Catalogue of the Fossil Mammalia in the British Museum" 365

Letters to the Editor:—

On "Seter," or Parallel Roads.—**Dr. Andr. M. Hansen** 365
Mimicry in a Neuropterous Insect.—**Dr. E. R. Johnson** 365
Fabry's Comet.—**T. W. Backhouse** 366
Mist-Bow.—**A. E. E.** 366
Movement of Telegraph-Wires.—**F. T. Mott** . . . 366
Henry Bradshaw 366
The Coal-Dust Question. By **W. Galloway** . . . 366
Vesuvian Eruption of February 4, 1886. By **Dr. H. J. Johnston-Lavis** 367
Tidal Friction and the Evolution of a Satellite. By **Prof. G. H. Darwin, F.R.S.** 367
On the Sound-producing Apparatus of the Cicadas. By **Prof. C. Lloyd Morgan.** (*Illustrated*) 368
Radiant Light and Heat, V. By **Prof. Balfour Stewart, F.R.S.** (*Illustrated*) 369
Notes 374

Our Astronomical Column:—

Naval Observatory, Washington 376
The Secular Nutation of the Earth's Axis 376
Astrophysical Observatory, Potsdam 376
Comets Fabry and Barnard 376
Stellar Photography 376
Harvard College Observatory 376
Astronomical Phenomena for the Week 1886 February 21–27 377
Geographical Notes 377
The Lumbar Curve in Man and Apes. By **Prof. D. J. Cunningham** 378
Snow-Covering and the Weather 379
University and Educational Intelligence 380
Scientific Serials 380
Societies and Academies 381
Books and Pamphlets Received 384